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**IMPROVING the  
ORGANIZATION of  
AGRICULTURAL SERVICES  
in PARAGUAY**

October -  
November 1965

**Report of a Study Team**

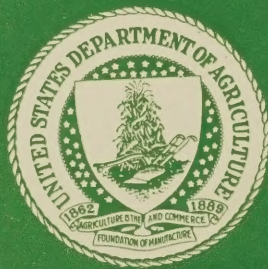
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cooperating with  
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IMPROVING THE ORGANIZATION OF  
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in

PARAGUAY

REPORT

of

A STUDY TEAM

October-November 1965

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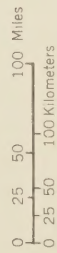
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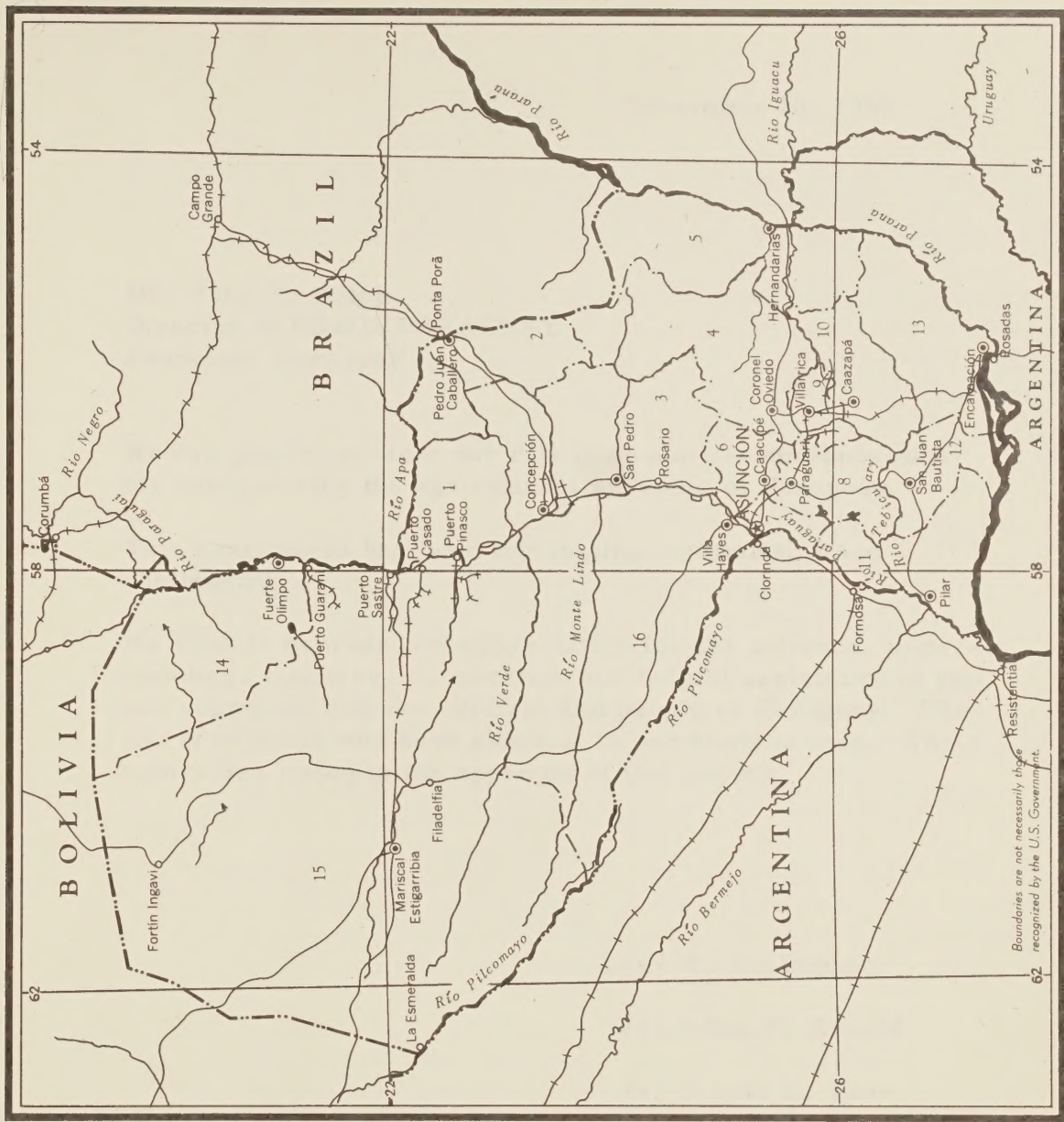
AGENCY FOR INTERNATIONAL DEVELOPMENT



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6. CORDILLERA
7. CENTRAL
8. PARAGUARI
9. GUAIRÁ
10. CAAZAPÁ
11. NEEMBUCÚ
12. MISIONES
13. ITAPUÁ
14. OLIMPO
15. BOQUERÓN
16. PRESIDENTE HAYES









November 20, 1965

Mr. John P. Wiley  
Director of USAID/PARAGUAY  
Asuncion, Paraguay

We are glad to present our report on and recommendations for reorganizing the agricultural services in Paraguay.

This assignment has been interesting, stimulating and challenging.

We wish to express our appreciation for the patience, understanding, courtesy, cooperation and helpful assistance of you and your staff and the officials and people of Paraguay. The list of persons who have aided us in our study is long. Their names are listed in the appendix of this report.

/s/ W. L. Popham

/s/ Adlai F. Arnold

/s/ Claude L. Horn

/s/ Luke M. Schruben

- W. L. Popham - Former Deputy Administrator of  
Agricultural Research Service,  
U. S. Department of Agriculture  
(Technical Consultant).
- Adlai F. Arnold - Team Leader, USDA/PASA/  
USAID-Paraguay, until recently  
Associate Professor of Agricultural  
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- Claude L. Horn - Team Leader, USDA/PASA/  
USAID-San Salvador, El Salvador.
- Luke M. Schruben - Chairman of this Committee,  
Assistant Administrator, Administration  
Federal Extension Service  
U. S. Department of Agriculture  
Washington, D. C.

## P R E F A C E

The USAID Mission to Paraguay in conjunction with the Government of Paraguay requested the Washington Office of A. I. D. Latin American Bureau to assemble a team for the following purposes:

1. Formulate a program for reorganization of government services in agriculture and animal husbandry, and outline the measures necessary to equip the Government of Paraguay for an effective agricultural program. This was to include reorganization of the Ministry of Agriculture and Livestock and STICA.
2. Advise the Government of Paraguay and USAID Mission on the manpower needed for carrying out the proposed reorganization, with special attention to immediate and projected manpower needs, plus recommendations as to how to meet such needs.
3. Advise the Government of Paraguay and USAID Mission on buildings and operating services needed for the reorganization.
4. Establish priorities for carrying out the reorganization.
5. Advise the Government of Paraguay and the USAID Mission on developing working relationships needed for the following organizations to effectively work together in accomplishing objectives of the Rural Development Program:
  - a. Ministry of Agriculture and Livestock
  - b. Interamerican Technical Service for Agricultural Cooperation (STICA)
  - c. Institute of Rural Welfare (IBR)
  - d. College of Agriculture and Veterinary Science
  - e. National Development Bank (BNF)
  - f. Supervised Credit Agency (CAH)

Upon request of AID/Washington, the International Agricultural Development Service of the U. S. Department of Agriculture, Washington, D. C. , selected the following PASA team members to make the study in cooperation with USAID/Paraguay:





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## I. INTRODUCTION

### A. Characteristics and Significance of Agricultural Sectors (Crops, Livestock, Forestry)

The following information contained in reports and references consulted in the conduct of this study was taken into account by the committee in arriving at conclusions and recommendations in regard to organization.

1. Paraguay is rural. Sixty-four percent of the population lives in rural areas. Fifty-two percent of the labor force is engaged in primary agricultural production. Sixty percent of the rural population is underemployed. An important part of the urban population directly or indirectly depends on agriculture.

2. Agriculture most important sector of economy. Agricultural production provides 36 percent of the gross national product. Industries relying on agriculture and forestry for raw products account for a substantial share of the balance. There is, however, wide disparity in the per capita share of income derived from the three segments comprising agriculture (livestock, crops, forestry). For example, with a national per capita income of \$192: Crop producers receive \$82, livestock producers \$490 and forestry \$167.

3. Most crop producers on a subsistence level, hardly within the money economy. About 129,000 or 86 percent of the 150,000 farms contain less than 20 hectares. These small holdings account for only 4.3 percent of total land area in farms and ranches. On the other hand, the 5 percent of farms of over 50 hectares occupy 94 percent of farm and ranch land. Most ranchers are within the upper 1.5 percent, in units of 500 hectares or more. These occupy nearly 90 percent of the land. There is little mixed crop and livestock farming.

4. Hand cultivation predominates. About 108,000 farmers (72 percent) produce less than 5 hectares of crops each. Only 1 percent produces more than 20 hectares.

5. Agriculture uses little technology. Despite the considerable volume and range of experimentation at the National Institute of Agronomy and at the livestock station (Barrerito), small farmers are slow to adopt new practices. Lack of communication is a retarding force.

6. Insufficient Credit. In 1963 industry and commerce used 84 percent of total credit, and agriculture 13 percent. Crop growers had only 10 percent of the credit they required. Although livestock producers were somewhat better served, credit extended to this segment in 1963 represented only ₡128 or about \$1.00 per head of cattle.

7. Productivity is low. Census data on 19 principal crops show yields in Paraguay to be among the lowest in the hemisphere. Field trials conducted by the National Institute of Agronomy and a few commercial farmers show that by fully utilizing present knowledge, wheat and soybean yields could be increased about 300 percent. Annual slaughter rate, now 12 percent of the cattle population, could easily be increased by 50 percent, and carcasses should weigh 20 to 25 percent more.

8. Markets are insecure and prices unstable. Markets and prices are subject to several interacting forces, including inadequate market research and production planning, inadequate commodity credit and transport and storage facilities; scarcity of good roads; excessive handling of commodities between the farm and the consumer, or the point of export. Under present conditions, there is opportunity for excessive profits in marketing.

9. Redistribution of rural population is needed. Forty percent of the rural population of Paraguay lives in the overcrowded central zone, while much land suitable for colonization remains unused. Although present colonization efforts numerically impressive, those who are bringing new lands under cultivation urgently need both credit and technical guidance.

10. Scarcity of well-trained technicians. Because salaries are low and foreign employment opportunities enticing, many who receive advanced training in livestock and agriculture leave the country. The present rate at which schools produce agricultural graduates and veterinarians is entirely too low. Training should be given increased attention and specialized graduate study further encouraged.

11. Agriculture receives insufficient government support. Agriculture produces 36 percent of the country's income and practically all of its foreign exchange, yet the budget of the Ministry of Agriculture and Livestock for 1965 is less than 2 percent of overall government expenditures.

12. High duties are paid on exports of agricultural products and imports of agricultural production goods. In 1960 import duties on items used in agricultural production varied from 25 percent to 94 percent ad valorem and produced an estimated revenue of \$1.5 million. In February 1962 export duties ranged from 1.6 percent to 10 percent, averaging 7.8 percent, and produced revenue at the rate of about \$2 million annually. Since then, duties on several products have been eliminated or reduced, thus placing agricultural products in a more competitive position in world markets. A higher national income could, over a period of time, more than offset any temporary losses in duty revenues through reduced duties on exports and imports.

#### B. Factors that Promote Economic Growth

This committee's collective experience and knowledge of agricultural history leads to the conclusion that when farmers are measurably better off economically each year, satisfactory growth in the national economy is promoted. A growing economy is reflected in social well-being which in turn leads to political stability of a nation.

Conditions that will bring about a sound progressive agriculture in Paraguay are:

1. Farm units big enough to permit efficient operation. Land needs vary according to type of farmers and managerial ability of the operator. Size must allow for a reasonable degree of mechanization. In Paraguay, scarcity of land is not a limiting growth factor.

2. Adequate credit to meet increasing production and capitalization requirements. Adequate credit must be available to producers who can effectively use it.



3. Widespread use of technology. Better varieties of crops, correct fertilization, improved cultural practices, effective insect and disease control are of major importance in improving yield and quality of crops. Livestock producers should continue to give more attention to such management practices as up-breeding, nutrition, and control of parasites and diseases. Each such practice calls for research and dissemination of findings through rural extension.

4. Stable markets and prices. Wide fluctuations in prices of agricultural commodities from year to year, and from season to season, continue to be a problem. Potential markets and marketing practices should be studied continuously. Quality controls in the form of grades and standards should be established as a protection to both growers and consumers.

5. Development of more, and better trained, agricultural technicians. The need for locally-trained agricultural technicians in Paraguay is urgent. This will require increased opportunity for young people to take advanced study in the sciences, and effective in-service training for those now employed.

The above five conditions are not listed in any order of priority. On the contrary, effort should be directed toward simultaneously improving all five.

Prerequisite to progress in these five areas is increasing annual appropriations for improving the institutions responsible for giving technical guidance to farmers, livestock growers and foresters; for providing better working facilities; and for increasing presently inadequate salaries of technical personnel.

#### C. Priorities for Production and Use of Crops and Livestock

The committee reviewed the short and long term agricultural goals listed in the Two Year (1965-66) Economic and Social Development Plan, and are in general agreement with the directions indicated. However, since both technically competent people and financial resources are scarce and likely to remain so for some time to come, we concluded that the following goals should be emphasized:

1. Stimulating production of commodities that will produce, or stabilize, foreign exchange. Considerable additional study is necessary to determine which ones offer most immediate promise. Meat, citrus, soybeans, tung and cotton appear to warrant special consideration. The study should concentrate on Paraguay's chances of competing favorably in world markets with particular attention given to political forces and opportunities for obtaining both technical and economic assistance from outside the country. Priority commodities should be given preferential treatment in the allocation of resources for research, extension, credit and marketing regulations.

2. Production of commodities for internal consumption. Production of staple food crops for local markets will likely continue to be the mainstay of small farmers in the central zone. Therefore, adequate resources for research, extension, credit and marketing should be allocated for development and improvement of crops that can be produced efficiently and profitably on small farms.

To insure efficient production of quality products, provision must be made to effectively control insects, diseases, and viruses. One of the most serious insects is the leaf-cutting ant (Ysau), which in some areas is reported to reduce potential harvest by 30 percent or more.

3. Processing agricultural products. This should have the direct effect of increasing employment and reducing population pressure in more congested rural areas. Paraguay could stimulate such development by continuing to encourage inflow of outside capital, technology and management.

#### D. Institutions and Service

1. All Paraguayan institutions concerned with agriculture should place top priority on training future agricultural technicians, if Paraguay is to remain competitive in world markets.

2. Agricultural institutions should carefully review their structure and insure that maximum use is made of the present technical staff while building for the future.

3. The GOP should set up a systematic procedure for taking advantage of available world-wide training grants and other technical assistance.

## II. FUNCTIONS AND OBSERVATIONS RELATING TO THE MINISTRY OF AGRICULTURE (Exhibit 1) AND STICA

Each Department Head of the Ministry of Agriculture and each unit of STICA were reviewed by direct interview of heads of departments and by reading and analyzing budgets and other documents. Much of the work of each was observed by visiting operating units in the field. This was done as background for the statements to follow:

### A. Functions and Observations of the Ministry of Agriculture

The following functional statements are a summary of department reports obtained from each of the department heads (Exhibit 1):

The Ministry of Agriculture and Livestock, currently employing 328 persons, is composed of ten departments and 37 divisions, in addition to the immediate supervision staff of the Ministry. With four or less persons in most divisions, this represents a large number of units in proportion to number of employees.

Central administration is made up of the Minister, his Secretary General, legal offices, personnel office, private secretary, and a communication division. This group, together with the general agriculture and livestock department, and the Director of the Administration Department, formulates Ministry policies and directs the work of the operating departments including staff level determination for all sub-units. The legal, personnel and communications units provide staff functions to the policy-makers.

The administrative section currently employs 26 persons and is engaged in such activities as payrolling, accounting, property procurement, workshop and transportation.

A brief description of the ten departments of the Ministry of Agriculture follows in order of total persons employed.



1. Department of Crops and Fruits. (Departamento de  
Agricultura)

The seven divisions by commodities include sugarcane, vegetable fibers, fruits, tobacco and miscellaneous crops (oil producing crops, coffee and stimulants, roots and tubers, quality studies of fruits and the extension of production technology to small farmers.)

Total number of personnel is 54 with 31 in Asuncion and 23 in the various districts.

Major attention is currently being given to sugarcane. A special tax is placed on sugar production to provide loan funds for growers. Nine inspectors work with sugarcane mills in performing the following functions: (1) certify the need for loans requested by growers, (2) advise producers on cultural practices, (3) act as mediator between growers and mills to establish time of delivery of cane to mills and (4) supervise loans granted.

The department works closely with the National Institute of Agronomy at Caacupe, but is not now receiving direct services from the College of Agriculture and Veterinary Sciences, National University of Asuncion. The Department also works with STICA extension, particularly with cotton. Cotton technicians are only placed in offices where extension is located.

Two chemists supported by the department are located in the Institute of Science in the National University of Asuncion and doing research on internal qualities of oranges and grapefruit.

2. The Department of Rural Welfare

This Department has four divisions: (1) Family Wheat Plan, (2) Home Economics, (3) Regional Agricultural Schools, and (4) Rural Extension.

The Family Wheat Plan promotes wheat production in certain areas of the country. The Home Economics Division helps rural families with home garden, home demonstration clubs, cooking, etc. The five Regional Agricultural Schools are located at Concepcion, Caazapa, Quiindy, San Juan Bautista (Misiones), and Villarria. They train personnel in elementary farm practices in addition to complying with the obligatory military service. The Rural Extension Division conducts a program of education in nutrition, home economics, and agricultural extension.

Fifty-three persons are employed with 25 in Asuncion and 28 in the five cities with agricultural schools.

Employees are classified as Administrative (21), Technical (27) and those having duties both administrative and technical (5).

The Department does not work directly with the College of Agriculture and Veterinary Science. The Regional Agricultural Schools are in constant contact with STICA Extension Service in their respective zones.

The Family Wheat Plan is strictly tied to the STICA National Institute of Agronomy and Forestry. A continuous contact is kept with the research in cereals, and seeds are acquired for multiplication and distribution.

### 3. Livestock Department

The Livestock Department has three divisions: (1) Animal Health, (2) Animal Industry, and (3) Laboratories. The Animal Health Division is charged with the inspection, diagnosis, treatment, quarantine of animals; the Division of Animal Industry with inspection and quality control of the meat industry; and the Division of Laboratories with studies of bacteriology, histology, parasitology and chemistry related to animal health and quality.

Thirty-eight persons are employed in this Department. The technicians are: veterinarians (23), regional and industrial inspectors (10). The rest of the staff does administrative and laboratory work.

Industrial inspectors are stationed at slaughterhouses with refrigeration. Veterinarians are located in slaughterhouses throughout the country. They are paid by the slaughterhouses.

The Division of Laboratories sends material to the College of Agriculture and Veterinary Science for analysis.

### 4. Department of Natural Renewable Resources

The five divisions are: (1) Forests and Nurseries, (2) Rural Engineering, (3) Wildlife and Fish, (4) Agricultural Meteorology, and (5) Soil and Water.

The Division of Forests and Nurseries is concerned with forest protection, forestation and reforestation. Rural Engineering is an auxiliary division serving the other divisions. The division of Wildlife and Fish is concerned with Wildlife protection. The Division of Agricultural Meteorology collects meteorological statistics and records atmospheric phenomena. The Division of Soil and Water is concerned with soil and water studies, the construction of terraces, crop rotation, etc.

Seventeen employees are located in the Ministry building, in Asuncion, three are located at the Forestry Stations (two at Santisima Trinidad and one at Eusebio Ayala).

#### 5. Department of the "Triangular Plan"

The three divisions are (1) seed laboratory, (2) inspection of enterprises, and (3) studies of land and water. The Department Head serves as an executive of the National Council of Public Waters. In this capacity he is primarily interested in water for rice irrigation.

The Division of Seeds and Laboratories produces and distributes improved rice and wheat seeds. The Division of Inspection is concerned with sanitation, drying and packaging, and machinery and pumping equipment. The Division of Land and Water studies preparation of land for rice production and measures stream capacity.

Personnel number (17) distributed by division as follows: Seeds and Laboratories 3, Enterprise Inspection 3, Land and Water Studies 5, and Overhead Administration 6.

#### 6. Department of Agricultural Economics

The Department has three divisions: (1) Statistics: Collection and compilation of statistical data on the principal agricultural products and their yield, rural and cattle population, and volume and value of exported products, (agricultural, livestock and forestry). (2) Markets and Prices: Compilation of all product prices in the Capital city and in the country and publishing the data. (3) Planning: Studies and compilation on the principal agricultural products, preparation of reports, participation in economic studies, and programming on agricultural and cattle development. There are 15 employees all located in Asuncion.

7. Department of Agricultural Mechanization

This Department has five divisions as follows: (1) Administration; (2) Work Organization: preparation, signing and control of work contracts; (3) Accounting: control of contracts, general accounting of all activities, purchase of machine spare parts, statistics and control of work in general; (4) Repair Shop: supervision and repair of equipment, machines, etc., tractor maintenance, instructions to operators, and (5) Work Execution: transportation of machines, fuel, etc., and execution of contracted work. There are 11 employees with seven located in Asuncion and four in Piribebuy.

8. Registry of Chattel Mortgages

The eight employees are in Asuncion.

9. Department of Cooperatives

This Department has the following Divisions: (1) Accounting, (2) Development and Assistance, (3) Production and Marketing, and (4) Statistics and Publications.

The office is charged with the development, control, coordination and assistance to agricultural and livestock cooperatives in accordance with the provisions of law. The six employees are station in Asuncion.

10. Department of Administration and Census

This Department deals with funds and administrative costs, inventory of properties and census - technical work. There are six employees.



Observations - Ministry of Agriculture and Livestock

1. The staff is composed of dedicated people who desire to contribute to the success of the GOP.
2. A high proportion of the Ministry budget is used to pay salaries, leaving little for operating expenses, thus many plans are made with inadequate resources available for implementation.
3. The Ministry is understaffed to provide the minimum services required.
4. Technically competent manpower is limited in relation to total needs.
5. The performance of the Ministry is handicapped because salaries are generally too low to attract and hold technically trained men. To perpetuate this condition will discourage college students from taking training in technical agricultural fields important to the GOP.
6. In general, the budget of the Ministry is inadequate to carry out its responsibilities to the agricultural sector of Paraguay.
7. It does not appear that a limited number of trained persons, employed only from 6:30 a.m. until 11:30 a.m., or slightly over one-half time, is in the best interest of the GOP.
8. The Ministry currently performs two basic functions: (a) regulatory, including inspection, quality control and grades and standards, designed to protect the consumer, farmers and ranchers; and (b) technical services performed for individual producers. These technical services parallel much of the work of STICA.

9. Efficient operations are greatly hampered by the physical facilities housing the Ministry. This facility, constructed 80 years ago for another purpose, leaks when it rains and lends itself to poor office arrangement. Noises from street, office machines, corridors and conversations from adjoining office make for work inefficiency.
10. Over the years, new divisions have been created as new functions were undertaken, rather than integrating them with ongoing functions of previously established units.
11. There is an obvious need for more and better trained agricultural manpower in Paraguay. Presently, this need is not being met and the deficiency is expected to be greater in the years to come. Therefore, the education of technical agricultural manpower has great significance for fulfilling the objectives of the Ministry of Agriculture and for strengthening the economy of Paraguay.
12. The Ministry has control of some land at various rural sites which are now mainly serving as locations for the five intended rural agricultural schools.

Recommendations - Ministry of Agriculture and Livestock

It is recommended that in implementing the program:

1. The Ministry and USAID consider engaging a person fluent in Spanish and experienced in government organization and management to work with the Minister and his department heads in preparing a statement of functions performed by each division. He would work with division directors and other staff members in preparation of job descriptions, job qualifications and performance standards. Based upon this work he would recommend staff realignment in accordance with the reorganization plan.
2. Technically trained and competent members of the present staff be placed on a full-time (40 hour-week) basis and be paid a salary high enough to command their best efforts and over a period of time attract other technically competent people.
3. Employees be hired on the basis of established qualification standards. This should result in fewer but more competent employees at higher wages for more effective public service.
4. Immediate consideration be given to construction of suitable office facilities for the Ministry on a site which would encourage close cooperation between research, rural extension and regulation.
5. Resources (financing, facilities and services) be made available to the various divisions of the agricultural sector commensurate with their relative importance. Exports are important to the Paraguayan economy and this recommendation gives emphasis to those agricultural products having greater export potential.
6. Two sub-cabinet positions be created: one to head research and Rural Extension and the other to head all regulatory services (Exhibit 2). At present there is one such sub-cabinet position. By establishing two positions, on the basis of distinct functions performed, the work can be clearly delineated and each head can devote his full energies to performing the function under his charge.
7. The present administration department be established as a direct operating division (Exhibit 2).

8. Staffing and operating budgets for the divisions be managed by respective division directors and their administrative staffs.
9. Four departments be grouped under the sub-cabinet position entitled General Director of Research and Rural Extension:  
(1) agriculture and forestry; (2) livestock improvement; (3) rural extension, and (4) economics and marketing (Exhibit 2). All of the present functions of STICA would be included in these four departments.
10. Four departments be grouped under the sub-cabinet position entitled Regulatory Services: (1) crop standards and regulations; (2) livestock standards and regulations; (3) natural resources conservation, and (4) control laboratories (Exhibit 2).
11. Two divisions in the current organization (Central Office for Chattel Mortgage and the Division of Cooperatives) continue to report directly to the Minister.
12. The present departments to be incorporated into the new organization include (a) Rural Welfare; (b) Tri-Plan Department, and (c) Agriculture. The reasoning back of this recommendation is as follows:
  - a. The Department of Rural Welfare performs two basic functions: (1) technical services to families and producers, thus duplicating Rural Extension Department functions. For this reason, those engaged in technical services should be incorporated into the extension function; (2) the Department of Rural Welfare also is responsible for the regional schools. Presently these schools are operating as secondary schools and do not appear to be performing the functions for which they were organized. They are also understaffed, with poorly prepared instructors and generally obsolete facilities.
  - b. The Triangle-Plan Department performs both research services and regulatory functions. These functions cut across similar functions of other Departments, therefore, should be assigned to the appropriate departments.



- c. The Agricultural Department functions are set up on a commodity basis and cut across lines of similar work performed by other departments organized on a functional basis. The proposed reorganization of the Ministry provides for its entire operation on a functional basis. The work and staff of this department should be assigned to the appropriate department depending upon the function of each staff member.
13. Consideration be given to the possible multipurpose use of the several rural sites now under Ministry control.
14. Staff meetings of department heads, as well as staff meetings of employees of each department, be held regularly. This would accomplish the purpose of sharing information on work in progress and would develop effective working relationships leading to cooperation and sharing in other important areas needing attention.
15. As much as possible, all new work undertaken be incorporated in the organizational structure to be adopted, thus holding the number of new divisions and sections to a minimum.
16. The GOP request the assistance of an agricultural education specialist from one of the United States Land-Grant Colleges for help in designing improvements in its agricultural education program. The specialist should have competence in both college level and vocational level education.
17. A competent person in the Ministry of Agriculture and Livestock be given responsibility for the management of the diverse array of grants and other aids available from many sources for the agricultural education of individual Paraguayans. His function would be to seek out grants from all sources and keep current information on those available. He would be the one to whom the various Ministry officers would turn to find the sources of support for the training of individuals. A Ministry committee concerned with the use of grants should be formed with this person as chairman.

B. Functions and Observations - Programs of STICA

1. Research

a. National Institute of Agronomy

Established in 1949 as a STICA project, the National Institute of Agronomy, near Caacupe, some 48 Km. from Asuncion, is one of the fine agricultural experiment stations in Latin America. Under the able and dedicated leadership of Ing. Hernando Bertoni, the Institute has demonstrated beyond challenge that Paraguay is blessed with a combination of human, soil, and weather resources found in few places elsewhere in the world.

Available to the Institute are some 264 hectares of arable land with 220 under cultivation.

The Institute receives an annual allotment of about \$96,000: about 45 percent is provided by the Ministry of Agriculture and Livestock and the remainder by USAID. Annual appropriations have remained virtually static for a period of 10 years, during which the demands on the station have increased substantially. This is reflected in a lack of specialists in certain important disciplines.

The Institute employs an average of 70 people, six of whom are trained agronomists, six field aids, and the remainder laborers.

Varietal tests involving 10 or more major field crops, 10 different kinds of grasses, and at least five kinds of citrus and other orchard crops are indicative of the magnitude of the program in progress.

Sub-Station

The sub-station near Encarnacion, a branch of the National Institute of Agronomy has been badly neglected. It is understaffed, facilities and machinery have deteriorated. Some pieces of essential equipment are no longer serviceable.

The sub-station employs 12 men, only one of whom is an agronomist. Mature tung and citrus trees lack care. Insects and diseases are taking their toll in the absence of materials and equipment to combat them. Only 50 hectares of more than a hundred of arable land at the Station are under cultivation. The remainder could be used to increase approved seeds and nursery stock for distribution.

The sub-station's primary function is to compare gross productivity of certain varieties of crops and grasses which have shown promise under soil and climatic conditions existing at Caacupe, and to maintain and nurture the orchards consisting of some 12,000 grafted plants (grapefruit, orange, tangerine, lemon and lime, also tung).

The Station is not now adequately equipped nor staffed to do the work originally intended. Unless it is to be revitalized its functions and objectives should be redefined.

#### b. A source of Improved Seed Is Important

In addition to the selection, importation, and varietal testing of a wide range of crops that appear adaptable to Paraguayan conditions, the Institute has for the past ten years distributed improved seed to farmers at nominal cost. More recently, fertilizers and pesticides have been made available. Seeds of both field and garden crops, citrus, tung, pasture grasses, and trees have been imported from the United States, Latin America, and various countries of Europe. These have provided basic stock for the extensive varietal testing program now in progress.

In 1964, approximately 107 tons of seed (corn, cotton, velvet beans cowpeas, peanuts, sorghum, castor beans and sesame) were produced and packaged for distribution to farmers.

#### c. Equipment

The National Institute of Agronomy is operating with a minimum number of efficient tools. At the sub-station all equipment is in need of complete overhaul or replacement. Current inventories are as follows:

#### National Institute of Agronomy at Caacupe

<u>Item</u>	<u>Age</u>	<u>Condition</u>
3 tractors	less than 3 years	good
3 tractors	14-16 years old	out of service
2 disc. plows	relatively new	good
2 harrows (disc)	relatively new	good
1 disc harrow	10 years old	good
1 drill (with fertilizer attachment)	14 years old	poor
1 combine	14 years old	fair
Remaining machinery	old	largely unserviceable
Equipment for cleaning, drying and storing harvested products needed.		

Sub-Station near Encarnacion

1 tractor	Transferred to Station 1954	fair to poor
1 thresher	1953	fair to poor
3 seeders	1946-1952-1953	out of order- poor usable
1 sprayer	1958	needs parts
1 pick-up	?	fair
1 combine	1958	fair
1 refrigerator	1957	good
1 generator power-light	1950	fair
1 disc plow	1949	poor

d. Observations

1. The National Institute of Agronomy reflects vision and mature judgment in early planning.
2. To the experienced visitor it seems incredible that so much new knowledge concerning Paraguay's potential in agriculture could be developed in such a brief period at so little cost. The United States and Paraguay can be justly proud of the development of the Institute through the technical and financial support of STICA.
3. There is country-wide interest in the experimental work at Caacupe. Approximately 5,000 people visited the Institute during the past 12 months. Some came to observe the varietal tests of wheat, others were interested in corn, cotton, beans, citrus, etc. Many were interested in the availability of improved varieties of seed, cultural practices, crop rotation, soil conservation, the value of commercial fertilizers, and methods of preserving or storing harvested crops.
4. The Institute has developed and maintained a close working relationship with leading experimental stations throughout Latin America, Europe and the United States.
5. By taking advantage of research performed elsewhere in the world, the Institute, in a period of twenty years, has produced information that otherwise would have taken a century of experimentation.



6. Steadily increasing demands on the Institute have not been met with a corresponding increase in personnel and facilities. The need for additional specialists in research to support both classroom instruction and rural extension has become urgent.
7. Information developed by the Institute cannot be fully utilized until there is more effective communication with the rural people.
8. One contribution that an agricultural research station can make is to demonstrate under practical field conditions the advantages of (a) using improved varieties of seed; (b) following recommended cultural practices (preparation of seed bed, cultivation, weed control, and soil conservation); (c) knowing when and under what circumstances to plant different crops for best results; (d) deciding when and under what circumstances it is profitable to use commercial (artificial) fertilizers; (e) controlling pests (insects, diseases, viruses, and soil-infecting organisms); (f) good storage facilities for harvested commodities; (g) proper rotation of field crops as a means of maintaining and improving the fertility and texture of the soil. Such services are presently available to farmers living near the Institute but there is a need for extension to include the entire country.

The production and distribution of approved varieties of seeds in other agricultural areas would hasten the educational processes and provide a valuable service to small farmers and ranchers.

9. Distribution of improved seed and nursery stock warrants top priority for several years to come. Private enterprise should be encouraged to become active in this field as demand for seed increases. At the present stage of development, good seed and appropriate tools are more important than the source of power (tractor, oxen or horses.)
10. Demands for quality seeds are likely to increase rapidly. Until such time as the Ministry is prepared to initiate an effective seed registration and certification program, responsibility for the production and distribution of seed should remain with the National Institute of Agronomy and the Rural Extension Service.

11. Forests are among Paraguay's most valuable assets. Proper management and utilization of existing stands should be given high priority while planning and developing restoration and management programs and practices for the future.
12. The experiment station near Caacupe and the sub-station near Encarnacion are in need of modern storage facilities for both equipment and harvested crops. Damage resulting from weathering is costly in either case.
13. Control of insects, weeds and soil-infesting organisms that limit production will become increasingly important as time passes. Further research in plant protection would contribute to a balanced program.
14. There is much unpublished information at the National Institute of Agronomy which, if published and distributed, would be of great value to the college, rural extension agents and farmers.
15. With USAID technical and financial support during the transition, orderly transfer of agricultural research from STICA to the Ministry should be accomplished without adversely affecting programs in progress.

e. Recommendations - National Institute of Agronomy

1. The popularly known Instituto Agronomico de Caacupe continues as the national center for crops and forestry research in the recommended Department of Agricultural Research and Forestry.
2. A minimum of 4 specialists be added to the staff of the Institute to achieve a balanced research program (1 forestry, 1 horticulturist, 1 entomologist, 1 geneticist).
3. At least four branch stations be established at strategical locations in other parts of the country including the Chaco to test and increase under local conditions the varieties of crops and grasses that have shown promise experimentally.
4. Within the Institute a section be created to study problems of forest resources including forest management and reforestation.

5. Immediate steps be taken to replace worn and outdated farm and laboratory equipment and to add modern cleaning, drying and storing facilities.
6. The director be furnished, on short-term arrangements, the services of United States specialists as needed.
7. Importation, testing and distribution of improved seeds remain a responsibility of the experiment station and that distribution to farmers be taken over by the Department of Rural Extension, thus better serving many rural areas remote from Caacupe.
8. That the Institute be provided with editorial assistance in publishing the results of past research and in keeping up to date with current publications on present and future research findings.
9. That the Minister appoint a committee to advise on long-range agricultural plans and policies. The committee to be composed of the director of the department of livestock and forestry and representatives as follows: One from the College of Agriculture and Veterinary Science, one from the Rural Extension Department and two from the Agricultural sector.

## 2. Barrerito Ranch

Barrerito Ranch has good potential as a profitable livestock ranch. It comprises some 10,000 hectares of native grassland of which 200 hectares are now seeded to improved grasses.

The project agreement establishing Barrerito Ranch as a joint US-GOP livestock improvement ranch was signed August 7, 1943. The stated objectives were to increase quantity and quality of beef produced per unit of land and capital investment by (a) introducing from other countries more productive breeds; (b) demonstrating selection and culling to improve herds; (c) controlling grazing as a means of improving the carrying capacity of native pasture; and (d) demonstrating the value of supplemental feeding during drought or other emergency.

The agreement further provided that: (a) marketing practices, both domestic and foreign, be studied and improved; (b) the ranch be used to demonstrate to livestock growers the benefits accruing from improved management practices; and (c) breeding stock be sold to ranchers wishing to improve their herds.

Twenty-two years later the situation may be briefly summarized as follows:

When the Barrerito Ranch project was established, land and improvement were valued at \$150,000 . The ranch was then supporting about 4,200 head of cattle. Estimated valuation today is: Land and improvements \$500,000; cattle \$350,000. Current inventory shows a total of 4,268 animals; 2,734 females; 385 bulls, remainder market cattle.

A few native cattle remain on the ranch. Gradual up-breeding of the herds has been accomplished with emphasis on Brahman and Santa Gertrudis breeds. Some Herefords (approximately 30 head) and Angus (60 head) have now been added for comparative studies. This transition to improved crossbred animals, for one cause or another, has been unduly slow considering that one of the original objectives was to demonstrate to livestock growers of the country what a few generations of selective breeding would offer in the way of increased returns per land and animal unit.

Fencing for pasture rotation and experimental grazing is inadequate. Some are in poor repair.

If the ranch is to be an example of good management, a bold new land development and utilization policy must be adopted. A well-designed demonstration to utilize available technology and efficient management in making this ranch a profitable enterprise might bring much benefit to Paraguay ranching.

Current operating procedures call for dipping to control ticks and other external parasites; and for vaccination against foot and mouth disease, black leg, brucellosis and anthrax. Measures to control internal parasites are regularly practiced. The most commonly recognized causes for animal deaths are digestive troubles and calving complications.



The ranch is equipped with power machinery as follows:

<u>Unit</u>	<u>Age</u>	<u>Condition</u>
1 Tractor	1952	Poor
1 Tractor	1957 (diesel)	Good
1 - 3-phase generator	1952	Fair
1 Sheppard electric gen.	1957	Fair
1 Willys pick-up	1961	Fair
1 Chevrolet pick-up	1964	AID transfer good
1 International truck	1964	(damaged) Poor

The ranch employs:

<u>Men</u>	<u>Position</u>	<u>Years of Experience</u>
1	Livestock Advisor - USAID	--
1	Ranch Manager	22
1	Administrative Assistant	15
1	Foreman	12
1	Insemination Technician	8
1	Insemination Trainee	--
1	Accountant	--
23	Laborers (average number on annual basis)	--

Animals sold in 1964:

Breeding stock:		
A. Bulls	179	
B. Heifers and cows	2,096	
For slaughter	657	
Calves produced	950	
Over-all percentage - calf crop:	61 %	
Animal losses during 1964	85	

The principal breeds used are Santa Gertrudis, Cebu, Brahman.

### 3. Artificial Insemination

The Artificial Insemination Center, which occupies 75 hectares of land belonging to the College, was established in 1953 as a practical means of expediting the up-breeding of both dairy and beef cattle. Its value to the livestock industry in the country is hard to measure. Certainly this Artificial Insemination service has had a beneficial effect.

The Center employs 25 people: one veterinarian, six trained technicians, and 18 clerical employees and laborers.

In its 10 years of operation the Center has imported 54 bulls: 27 from the United States, the remainder from Uruguay, Argentina and Brazil. High quality semen of the Holstein and Jersey breeds is made available to the dairymen of the Asuncion area; and Brahman, Santa Gertrudis, and Angus breeds to beef cattle producers throughout the country. Artificial service is provided for seven to nine thousand cows per year. The fees charged pay no more than thirty percent of the cost of operation.

## Observations

1. In assessing the contribution of STICA to the livestock industry of Paraguay, it is noted that this institution was responsible for many benefits such as: (a) stimulating the dairy industry by importing the first purebred dairy bulls, and by later establishing the Artificial Insemination Center in 1953; (b) establishing improved pastures in research; (c) stimulating country-wide interest in herd improvement and disease control by the work at Barrerito Ranch; (d) introducing Brahman, Santa Gertrudis, and cross-bred bulls; and (e) by initiating brush control in the Chaco.

The intangible benefits of STICA are difficult to measure, but such benefits are nonetheless real and will continue for many years.

2. The Barrerito area is not considered one of the better grazing areas of Paraguay.

3. It is reported that over-grazing, or lack of controlled grazing, has resulted in pasture deterioration. This could reflect lack of objectivity in planning, lack of water in right places, inadequate fencing for proper pasture rotation, lack of continuity in purpose and management, or some combination of these factors.

4. Barrerito has lagged behind its potential as a livestock and pasture improvement center.

5. Progress in the upbreeding of herds has been slow in developing.

6. Only recently have improved pasture grasses received attention as a part of the overall management program.

7. In 1965 the Barrerito Ranch continues to offer a challenge and opportunity to compare, on various soil types, the carrying capacity of native pastures properly managed; and to evaluate under practical operating conditions improved grasses recommended by the National Institute of Agronomy.

8. Pasture management (controlled grazing for maximum production per unit of land) warrants increased attention. The need for a long-range carefully developed plan is indicated.

9. While Barrerito is not the best ranch in the country, the Committee finds no obvious reason for it not being a self-supporting enterprise which allows opportunity to demonstrate the use of available technology in breeding, animal health, and pasture management.

10. Through good planning and ranch management the Barrerito Ranch should quickly regain leadership in livestock improvement and be a useful demonstration of a technically sound breeding and land utilization program. Pasture improvement studies call for tight control of grazing. Once a long-range pasture improvement program is adopted, it should be strictly adhered to and detailed records kept until such time as it has served its purpose, or new knowledge warrants change. Continuity in management cannot be over-emphasized.

11. USAID technical assistance and close coordination with Caacupe in developing land utilization and management plans.

12. The Artificial Insemination Center could also serve as a point of contact with livestock breeder associations in other countries; (1) as a teaching aid to be utilized by the faculty and students pursuing courses in veterinary science and animal husbandry, and (2) as a receiving station for animals being introduced from other parts of the world. Otherwise, it would appear that the introduction of new blood lines would rest largely with the few who could profitably acquire their own equipment and maintain their own stud, introducing new lines as their own program dictated.

13. Although livestock production is a dominant element of the national economy, the committee did not find an adequate research institution to support animal enterprises in Paraguay. Just as the National Institute of Agronomy at Caacupe has brought benefits to the crop producers, a similar research department can scientifically find ways to benefit the animal enterprises of Paraguayan ranches and farms. Poultry, swine, milk cows and other animals are important in Paraguay and need to receive research attention.



Barrerito Ranch Recommendations:

It is recommended that:

1. A Department of Livestock Improvement be created and that a professionally competent Paraguayan be named director. Headquarters at San Lorenzo would have the advantage of close association with the college, and ready accessibility to the Ministry.
2. The Department assume two major functions: (a) basic research in animal husbandry and veterinary science, and (b) cooperation with ranchers and farm operators in herd and pasture improvement programs.
3. Imported animals be held in quarantine by the Institute 30 to 60 days before release.
4. Livestock research be extended to include dairy, swine, sheep, poultry and other farm animals as need arises.
5. Management of the Artificial Insemination Center be transferred from STICA to the Department of Livestock Improvement, the Animal Breeding Division and be continued as a partially self-supporting unit designed to provide a reliable source of semen for livestock growers; a point of contact with livestock breeder associations in other parts of the world in regard to artificial insemination and to serve as a teaching aid to faculty and students pursuing courses in animal husbandry and veterinary science.
6. Barrerito be placed under the control of corporation and managed as a practical livestock operation following a technically sound, long-range program of upbreeding the herds and improving pastures, using profits to further improve Paraguayan ranch efficiency.
7. That a person having proven ability to the livestock business be employed by the corporation as resident ranch manager.
8. USAID provide the Barrerito ranch manager with the services of a U. S. consultant, trained in animal husbandry and with extended experience in managing a livestock enterprise for profit. The consultant should be available full-time for one to two years and at frequent intervals thereafter (depending on development) for three to five years.

9. That the Board of Directors give careful attention to retaining on the Barrerito Ranch only those beef breeds that have shown definite promise of contributing to the upgrading of native cattle.

10. That technical assistance be provided in developing a research program in the recommended livestock improvement department.

### 3. Rural Extension

#### a. Definition

Rural Extension is concerned with assisting farm and ranch operators and their families to make practical use of research findings and technical information such as: (1) proper use of fertilizers; (2) planting improved varieties of seeds and plants; (3) improving pastures; (4) improving livestock feeding; (5) effectively using agricultural chemicals in the control of insects, parasites, undesirable plants, plant and animal diseases; (6) adopting efficient production methods, and (7) making full use of government credit and other services.

Rural Extension works with homemakers in teaching such subjects as: (1) improved diets for the family; (2) labor-saving ways of home-making; (3) sanitation and health habits; (4) home gardens for family consumption; (5) sewing clothes for the family; (6) home industries to augment farm income; (7) good family relations; (8) home equipment and similar skills.

Rural Extension teaches boys and girls many of these skills. The importance of education and cooperation as prerequisite to success as an adult is emphasized. Boys and girls carry projects involving crops, livestock, poultry, home gardening, cooking, sewing, home industry, in which skills are taught by agents and local volunteer leaders.

The Rural Extension Service uses many teaching methods. Because many producers cannot read, visual aids are used to picture the steps necessary to carry out improved practices. Because most people believe what they see or do, demonstrations help the individual to apply recommendations. Others are organized as "result demonstrations," thereby improved practices are applied alongside the old way of doing things. Neighbors are invited to see the result as the crop or animal grows. Such demonstrations are particularly effective in teaching new and improved technology, and the 4-C club boys and girls are good at carrying them through.

The Rural Extension Service maintains close working relations with research groups, the College of Agronomy and Veterinary Science, and the work of the regulatory agencies; because all such work directly affects either the farmer or the livestock growers.

#### b. Operations

The Rural Extension Service is financed by the Ministry of Agriculture and by STICA. In addition, similar technical services are being provided to growers by several other agencies of the GOP. Several Departments of the Ministry of Agriculture provide technical services; the Banco de Fomento has personnel advising growers on the application of technology; and IBR employs technicians to work with the colonists on both production and family problems. Thus the total effort devoted to extension type work is quite significant.

Rural Extension consists of (1) a central office with a Director, a Vice-Director, a leader of 4-C clubs, a director of information and agriculture, a translator and a home economics section, plus two secretaries; (2) an Office of Information with head of section, press and radio staff member, an editor, a draftsman, a photographer, a multilith operator and one secretary; and (3) 18 field service offices, with 18 Agricultural Agents, 18 4-C agents, 11 Home Economics Agents and two secretaries. Local offices have been established in the following centers: San Lorenzo, Carapegua, Acahay, Concepcion, Villarrica, Horqueta, Pedro Juan Caballero, Caazapa, Encarnacion, Coronel Oviedo, San Ignacio, Yaguaron, Eusebio Ayala, Puerto Presidente Stroessner, Arroyos y Esteros, Caaguazu, Coronel Bogado and San Pedro.

Except for the Rural Extension Director, all members of the extension staff are Paraguayans. The total extension staff at the time this report is being prepared is 63, with five secretaries and 58 professionals. The training for Extension Agents varies from Engineer Agronomo of the Faculty of Agriculture and Veterinary Science, to graduates of secondary schools supplemented by from two weeks to six months of in-service training. All agents have had varying periods of intensive training.

The budget for Rural Extension for FY 1966 is \$ 25,157,153 of which \$ 7,106,400 is direct U.S. support and \$5,040,000 represents PL-480 loan funds.

c. Observations

1. Rural Extension work is respected and supported by people who receive the service and by the public generally.
2. 4-C Clubs are active, growing in number and highly respected. Effective voluntary leaders are being developed.
3. The Rural Extension educational program has demonstrated the value of a link between research and technical information and the rural people of Paraguay.
4. Home economics work has made a commendable contribution to improved family living.
5. Competency of the field force has been upgraded through in-service training and through employment of better trained people.
6. Technical backstopping of Rural Extension Agents by highly trained specialists in practical application of new technology is inadequate.
7. Rural Extension agents occasionally confer with the College of Agriculture and Veterinary Science and the National Institute of Agronomy and Forestry in Caacupe.
8. Administrative and supervisory staff has not kept pace with the increase in the number of field Extension Offices.
9. Rural Extension Agents have received more training in educational methods than in technical subjects.
10. In addition to technical services, supplied to individual producers through the Rural Extension Service, similar services are being provided by some Departments of the Ministry, by the National Development Bank and by IBR.
11. Although Rural Extension is coordinated at the top by the Minister of Agriculture and the USAID Agricultural Officer, there is little evidence that operating units are cooperating in mutual support.



d. Rural Extension Recommendations

1. Technical backstopping of Rural Extension field agents by the use of technically trained and competent specialists should receive highest priority. Specialists should be provided in the following order: (a) crop production; (b) livestock production; (c) plant pathology; (d) veterinary science; (e) commodity for such crops as wheat, rice, tobacco, cotton, citrus, etc. Some specialists are now employed by the Ministry, the Institute of Agriculture, or by contract with the Faculty. Their services should be made available to train Rural Extension Agents to the fullest extent possible. Employment by Rural Extension should be limited to those positions requiring full-time work with field agents in establishing demonstrations and translating their results.
2. After adequate administration, supervision and technical backstopping has been provided to the present field staff, the number of field offices should be expanded to serve the needs of the farm and rural sector. A minimum of three agents (Agricultural, 4-C, and Home Economics) and one secretary for each office is recommended. At least one of these agents should be technically trained in the production of the priority crops grown in the area. All agents should receive increased training in technical subject matters relative to training in educational methods.
3. Training of Rural Extension agents should be continually upgraded until at least one agent in each field office has the equivalent in training of an Ingeniero Agronomo heading each office. Salaries paid and employment policies should provide steps to achieve this goal. This action is essential to assure that each field office will have at least one staff member who can provide the leadership in more closely linking agricultural producers to a wide range of research results and technical information as it becomes available.
4. The Rural Extension Administrative Office be housed as an autonomous entity at San Lorenzo. Because the Rural Extension Service will greatly benefit by close contact with research and faculty staff, it is highly desirable that their physical location permit such contact. The possibility of using PL-480 funds for providing a building should be explored.

5. All technical services provided to individual producers by staff members of the Ministry, the National Development Bank and IBR should be incorporated into the Rural Extension Organization. This means that the people, their salaries and operating expenses would be transferred to Extension. This would permit the number of field offices and supporting staff to be expanded for more effective service to a larger segment of the rural population. To achieve this, each field position should be reviewed with respect to function. Where the function is predominantly technical service, the position should be transferred to the Rural Extension Department.

6. Establish a National Extension Advisory Committee to the Ministry. Because effective Rural Extension work must have the active support and participation of the rural people, and because Rural Extension should promote an understanding of the many credit and regulatory services of GOP; it is necessary to maintain a close liaison with many units of GOP. For this reason the Advisory Committee should be made up of nine members; one from the regulatory services, appointed by the Minister; one from credit, appointed by the National Development Bank; one from the College, named by the College; one from the National Institute of Agronomy, named by the Institute; one from the Livestock Improvement Department, named by the Department, and one each from the National 4-C clubs, the agricultural organizations and home economics. The Director of Rural Extension would serve as Chairman of the Committee.

7. In view of USAID purpose to assist Paraguayans to conduct an effective Rural Extension program, it is recommended that no U. S. citizen have operating responsibility.

8. All Rural Extension employees should work full time (40 hours per week) and be paid on that basis. Field office Ingeniero Agronomos should be paid at a starting rate of ₡18,000 to 24,000 per month depending upon their training and experience, and up to ₡32,000 per month after several years of successful experience.

9. In conformity with recommendation 13 regarding the Ministry of Agriculture and Livestock, consideration should be given to the use of several rural sites, now under Ministry control, to determine whether these may be used to facilitate the extension purposes.

### III. COLLEGE OF AGRICULTURE AND VETERINARY SCIENCE

The college was created by Law, September 20, 1954, and activated in the Spring of 1956. Physical facilities provided by the Ministry of Agriculture and Livestock included 700 acres of land and several buildings previously occupied by the Coname School of Vocational Agriculture at San Lorenzo.

Prerequisites for College entrance are six years primary and six years secondary schooling. The first class was graduated in 1960. Through 1964, 72 had been awarded degrees in agronomy and 70 in veterinary science.

The College faculty now consists of 8 full-time professors and some 80 who teach one or two classes part-time. University law does not permit an instructor to teach more than two classes in the same College.

Four of the eight full-time professors have been to other countries for advanced training. Within a year the remaining four will have a similar opportunity.

In 1960 USAID contracted with Montana State College for services of three professors to upgrade the curriculum in animal and plant science, agricultural economics and farm mechanics. This contract ended in 1962.

In June 1964, a similar contract was signed with New Mexico State University which provided for assistance in:

1. Improving administration through better organization and training of administrative personnel.
2. Developing an improved curriculum with special emphasis on basic sciences.
3. Improving teaching and laboratory facilities, in-service training, and acquiring equipment to meet requirements in specialized fields.

4. Developing closer cooperation between the various facilities comprising the National University, and coordinating the efforts of the College with those of the National Institute of Agronomy and the Agricultural Extension Service.
5. Securing advanced training for full-time professors.
6. Developing an integrated program of research, classroom teaching and rural education.

The contract calls for one full-time scientist with experience in developing and administering research and teaching programs, plus 24 months of short-term consulting help in specialized fields.

#### Observations

1. Research and rural extension are basic to the development of a sound and progressive agricultural economy in Paraguay.
2. Training of Agricultural technicians and advisors is most urgent. Much can be learned from research work in other countries, but the answers to Paraguayan problems must come from studies conducted under Paraguayan conditions.
3. A foundation for advanced study in the agricultural sciences suggests the need for vocational training, either in the secondary schools or immediately following completion of secondary education.
4. Departments within the College have been built around available talent in the teaching staff. Although for some time to come teaching must remain the primary function, there is need for more specialized training of the faculty to engage in basic research. It is important to coordinate such research with the research activities of the Ministry of Agriculture.
5. There is a need to improve laboratories and classrooms; add more full-time professors in high priority fields (animal husbandry, veterinary science, crops for export, marketing practices, plant protection, forestry); and procure teaching aids and further expand the library to include additional technical reports and journals.



6. The recommended departments of Livestock Improvement; Agriculture and Forestry Research; and Rural Extension; together with the College of Agronomy and Veterinary Science are all essential to the future of the agriculture and livestock economy of Paraguay. At some future date these might advantageously be combined to form a rural university.
7. The Soils Laboratory initiated and formerly operated by STICA already has been transferred to the College and is operating efficiently. The STICA Plant Disease Laboratory is presently located in a facility provided by the College and a cooperative program in brush control between STICA, the College and local ranchers is being carried out with College leadership.
8. The farm on which the campus is located, if placed under intensive management would fulfill a research need, serve as a demonstration of good farm practices, and provide an additional source of improved seed as farmer demands increase.
9. Specific recommendations for the College are beyond the scope of the Committee.

#### IV. SEQUENCE OF REORGANIZATION AND BUDGET IMPLICATIONS OF MINISTRY OF AGRICULTURE AND LIVESTOCK INCORPORATING STICA FUNCTIONS

##### Sequence of Implementation

1. The administrative organization of the Ministry as set forth in Exhibit 2 should be implemented for all units enclosed in solid lines. New units are enclosed in dotted lines and their priority discussed in this report.

2. By means of agreements between USAID and the Ministry, functions of STICA should be continued but would be transferred to appropriate departments or divisions of the recommended new organization and placed under administration of Paraguayans. Agreements should provide for research and extension functions at a minimum acceptable level as set forth in the recommendations for each unit.

3. Provide adequate facilities to house the Ministry as reorganized (Exhibit 2). This facility should be adequate to provide offices, laboratory space and conference rooms.

4. Upon completion of facilities as specified in 3 above, the STICA staff should be physically transferred to the new facility at San Lorenzo, together with the U. S. counterparts provided for in project agreements.

5. Adjust hours of work of employees in the Ministry to full time (40 hours per week) paying adequate salaries and using no more than 75 percent of the funds for salaries with the balance used to implement the work.

##### Budget Implications

1. To reorganize the Ministry without adding new units should save some funds or increase services rendered.
2. Project agreements between the Ministry and USAID will not involve increased revenue if negotiated for the same services now being provided. Providing the service at current level is not recommended as set forth in subsequent points.
3. It is beyond the scope of this Committee to compute costs of providing adequate facilities. It is suggested that PL-480 funds be used to finance the facilities.
4. Cost of moving the STICA staff to the new facility at San Lorenzo will be nominal.
5. To provide full 40-hour week employment and adequate operating funds for the present staff of the Ministry will require a budget approximately 75 percent larger than the current budget.

6. The present field staff of Rural Extension should be upgraded to provide at least one Ingeniero Agronomo in each field office.
7. Four Ingeniero-Agronomos and four aides should be recruited to augment the staff at the Institute of Agronomy and Forestry as well as a Manager and field aides for each four branch stations in areas remote from the Institute of Agronomy and Forestry at Caacupe.
8. Capital required to upgrade operations of the Institute of Agronomy and the Barrerito Livestock Ranch:
  - a. Repair, remodel or replace equipment at the Caacupe Central Station. Modern cleaning and drying equipment located at the central station should be added in order to effectively determine long-range feasibility of wheat and other grain production. Essential equipment for each of the outlying stations as determined to be necessary should also be provided.
  - b. The Barrerito Livestock Ranch will require additional fencing for pasture management, water supply to match, and the herd increased.
  9. The proposed divisions and departments outlined by dotted lines in the reorganization of the Ministry, Exhibit 2, should be established as fast as funds are available, during the next five years in the following order:
6. To upgrade the present Rural Extension central and field offices will require Q2,400,000 per year more than current costs.
7. To add four Ingeniero-Agronomos will cost Qs260,000 to Qs300,000 per year. Four managers of outlying stations will cost Qs200,000 to Qs225,000 each per year. Field aides will cost Qs100,000 to Qs120,000 each per year.
8. The committee did not attempt to determine the cost of bringing the research stations up to acceptable levels. This will require a detailed study. This cost would be a one-time capital investment. Therefore, sources of funds for this purpose should be explored.
9. Sub-sections a, d, e, and f constituting 10 divisions will require at least three well-trained staff workers and 3 assistants together with an operating budget. The cost is estimated to be Qs1,000,000 per year for each division.

- a. A Foreign Market Analysis Division under the Economics and Marketing Department.

Sub-sections b, c, and g, consisting of four divisions will cost an estimated 2-1/2 million Qs. each.
- b. A Livestock Grades and Standards Division in the Department of Livestock Regulations.

To implement sub-section h, Rural Extension field offices, will require a minimum of 20 additional offices. It is estimated that one-half of the personnel needed are now employees of the Ministry, currently engaged in technical service work with individual producers.
- c. A crops Grades and Standards Division in the Department of Crops Regulations.
- d. Four Divisions under the Department of Agriculture and Forestry, Crop Diseases and Pest Research, Forestry, Soil Management and Conservation and Farm Machinery.

To establish new offices with staff currently employed will cost no more than Qs200,000 per year, per office to pay adequate salaries and operating costs. To establish offices with new personnel and pay support and operating costs will cost Qs750,000 per year.
- e. Three Divisions under the Department of Livestock Improvement; Livestock Disease and Pest Research; Livestock Breeding; and Livestock nutrition.
- f. One division under the Department of Rural Extension, to be called the Regional Agricultural Training Center.
- g. Two Divisions in the Department of Natural Resources;  
(1) Water Protection and Distribution, (2) Forest Protection.
- h. Increase the number of Extension Education offices within the limits of present technical staff in strategic locations important to agriculture, and also locate additional offices where needed to render adequate Rural Extension Educational Services to all rural areas.
- i. The new Control Laboratories department would include the present Laboratory Division and would not increase net cost to Ministry.



SUMMARY OF ESTIMATED COSTS  
(OMITTING THOSE FOR FACILITIES AND MACHINERY  
BEYOND THE SCOPE OF THE COMMITTEE)  
TO IMPLEMENT RECOMMENDATIONS FOR REORGANIZATION  
OF THE MINISTRY OF AGRICULTURE

Current budget of the Ministry on 12-month basis

	Gs.
FROM CURRENT INCOME . . . . .	92,000,000
FROM SPECIAL LAWS NOT AVAILABLE AUTOMATICALLY TO MINISTRY (21,590,400)	

LESS DIRECT SUPPORT OF:

	Gs.
IBR . . . . .	8,000,000
CAH . . . . .	8,000,000
PAEN . . . . .	2,000,000
STICA . . . . .	10,000,000
FAO . . . . .	300,000
CATHOLIC SCHOOLS . . . . .	<u>950,000</u>
 Total direct costs . . . . .	 <u>29,250,000</u>
Total current Ministry Budget . . . . .	62,750,000
 Cost to bring current staff of Ministry to full time . . (40-hour week) and provide adequate operating budget	 46,100,000
 Cost of 10 new Divisions in Department of General Research and Rural Extension Gs1,000,000 each	 10,000,000
 Cost of 5 new Divisions in the Department of General Regulations 2-1/2 million Gs. each	 12,500,000
 Cost to properly staff the Institute of Agronomy . . . (as indicated in No. 7 above)	 2,500,000
 Cost to upgrade and maintain present 18 field offices of Rural Extension (as indicated in No. 6 above)	 2,400,000
 Cost of 20 additional Rural Extension offices . . . . . (as indicated in No. 9 above)	 <u>9,500,000</u>
TOTAL BUDGET REQUIREMENTS in addition to current USAID support	145,750,000
TOTAL CURRENT SUPPORTING COSTS . . . . .	<u>29,250,000</u>
TOTAL BUDGET . . . . .	175,000,000

V. FUNCTIONS AND OBSERVATIONS - INSTITUTE OF RURAL WELFARE; NATIONAL DEVELOPMENT BANK; AND SUPERVISED RURAL CREDIT AGENCY

A. General

The committee reviewed structure and program of the Institute for Rural Welfare, National Development Bank, and the Supervised Rural Credit Agency to assess the relationship of these institutions to the Ministry of Agriculture and the agricultural program in Paraguay.

Each of these organizations provides technical aid to farmers and livestock producers. Therefore, we conclude that the agricultural program of Paraguay would benefit from placing all such technical assistance under the recommended Rural Extension Division. This refers to technical assistance designed to help individual producers use the best technology and experimental results as they become available. To be effective, technicians must be constantly trained in the latest results of research and technology and in its application to farmers and ranchers.

The committee wishes to point out that credit needs of small farmers, constituting a large segment of the total, are not being met by the present credit institutions. It is proposed, therefore, that a careful study be made of this problem with a view to creating an adequate credit program for this sector.

As colonization continues, the GOP would benefit by coordinating such activities with the related services of the Ministry of Agriculture and Livestock, and other government agencies.

B. Institute of Rural Welfare (IBR)

The Institute of Rural Welfare was created by Law No. 852 in March, 1963. Antecedents to the Institute were: (1) the Department of Land and Colonization prior to 1951, and (2) the Institute of Agrarian Reform from 1951 to 1963. In addition to Law 852, the Institute has its legal basis in a number of other laws, which include 622, and 662 of 1960, Law 854 of 1964, and Decree-Law 370 of 1964.

The highest authority of IBR is a council of six members, one of whom is the president of the Institute. Its power is determined by provisions of the agrarian statutes. About two-thirds of the 300 employees of IBR are in Asuncion. The three chief management branches of IBR are: (1) Technical services, (2) colonial management and (3) administration. Each is subdivided into departments.

The authority of IBR includes power to perform functions in the field of colonization including (1) general immigration and redistribution of the population, (2) registration of land titles, (3) establishment and administration of public works and services in zones colonized, (4) carrying out of technical, social and economic assistance, (5) application of the law to large properties, (6) solicitation of expropriation of unimproved rural lands and (7) application of sanctions, fines, etc.

#### Resources available to IBR

In 1964 and 1965 IBR had the following resources of income (in thousands of Guaranies):

	1965		1964	
	Guaranies (1000)	Percent	Guaranies (1000)	Percent
Sale of Land	45,000	36	40,000	50
Forestry	34,400	27	22,600	28
Grazing Fees, Rental, etc.	11,000	9	7,878	10
Government of Paraguay	9,600	8	9,600	12
Loans	26,334	20	0	0
Total	126,334	100	80,078	100

The IBR has 35 employees engaged in technical assistance to the colonists as follows: 20 agronomos, seven Ingenieros-agronomos, six social workers, and three veterinarians.

In the colonies supervised by the IBR there are 180 primary schools, 320 classrooms, 340 teachers and 18,759 students.

Observations:

1. A relatively new organization, IBR has tackled the large and complex task of colonization with energy and drive. The chief activity has been distribution of land and physical location of colonists on their lots.
2. IBR needs more technical, human and capital resources to supply the supporting services necessary to assure the successful establishment of permanent productive colonies; more roads, schools, medical centers, and technical and economic assistance to the colonists.
3. Although there is cause for optimism in the benign climate which makes at least a subsistence level easy to achieve, and in the remarkable fortitude and pioneer spirit thus far displayed by the colonists, the rapid expansion of colonists on the land without adequate supporting services could place the colonization effort in danger.
4. Many colonists may not be able to clear and cultivate more than the minimum number of hectares necessary for subsistence. Without capital and tools, the new colonists will be hard pressed even to supply their families with the bare necessities of life. Few can rise sufficiently above the subsistence level to finance clearing the rest of their land.
5. Under existing credit opportunities, it is difficult for the typical new colonist to obtain a loan because he lacks security or because he does not live in one of the zones served by the National Development Bank and the rural Extension Service.
6. Colonization has an important role to play in the economic development of Paraguay. It is cited as a concrete case of accelerating agricultural production by bringing new areas under cultivation (Annual Report of the Technical Secretariat for Planning, September, 1965, mimeo). The report points up the need, parallel with the distribution of lands, to open new roads, and provide other basic requirements such as light, water, sanitation, and education.



7. Under its broad powers, the IBR is carrying on such activities as providing health facilities and schools, hiring and paying teachers, and providing technical assistance to colonists in agriculture. It cannot be said that such activities are duplicating the efforts of other government services, because generally these agencies have not been working in the colonies. The participation of IBR in these fields has arisen from the necessity of trying to fill a gap in essential services.
8. In 1964 and 1965, 87 and 92 percent respectively, of the operational income came from other sources than direct support from the GOP, therefore economically, it is relatively independent in its activities.
9. Laws forming the legal basis for IBR make it largely an autonomous institute with considerable latitude for decision making.

If colonization is to be given high priority in the economic development of Paraguay, the GOP should consider more support, especially in technical assistance, educational facilities, teachers' salaries and health facilities.

Greater coordination of activities of IBR with those of other agencies in the GOP should be achieved. This would permit the institution to concentrate on tasks peculiar to colonization.

### C. The National Development Bank (BNF)

#### Description

The National Development Bank (BNF) was created by Decree-Law No. 281 on March 14, 1961. Replacing the Bank of Paraguay, it is supervised by an eight-man council which includes the President. Members of the following groups of organizations from the council: (1) Ministry of the Treasury, (2) Ministry of Agriculture and Livestock, (3) Ministry of Industry and Commerce, (4) Central Bank of Paraguay, (5) the private agricultural sector, (6) the private livestock sector, (7) private industry, and (8) the president of the Bank.

A general summary of the Bank's personnel is as follows:

<u>Central Office</u>	<u>Number</u>	
Administration council	8	
Administrative officials	165	
Orderlies	25	
Service personnel	28	
Temporary personnel	88	
Police force	<u>8</u>	322
<u>Interior Branch Offices</u>		
Administrative officials	113	
Orderlies	4	
Watchmen	1	
Temporary personnel	<u>6</u>	<u>124</u>
TOTAL		<u><u>446</u></u>

#### Functions

The BNF was established to provide a source of credit for development of the Paraguayan economy, including promotion of agriculture, livestock, forestry, and industrial enterprise.

The bank has authority to adopt forestry plans and production programs for agricultural, livestock and industrial development in coordination with the national economic planning board. It provides credit for all sizes of enterprises such as short- and medium-term loans to small farmers, dairymen, fruit growers, silviculturists and small industries.

## Bank Organization

There are three main departments: (1) Development, (2) Agricultural and Livestock, and (3) Commerce and Savings.

The Development Department extends medium or long-term loans for developing agriculture, cattle production, forestry and large-scale industry.

The Agriculture and Livestock Department makes relatively short-term loans in more limited amounts to small farmers, ranchers, dairy farmers, truck farmers, lumbermen, and small industries for processing and storage facilities for marketing agricultural and livestock products.

The Commerce and Savings Department extends business credits, deals in foreign currencies and business documents, and accepts time and savings deposits.

Authorized capital of the Bank is 1,500 million Guaranies which can be readjusted in accordance with periodic reviews. The authorized capital is distributed among the three Bank executive departments as follows:

	<u>Authorized Capital</u>		
	1,000 Million ¢		
Development Department			
Agriculture and Cattle Department	300	"	"
Commerce and Savings Department	200	"	"

## Loans being administered pending or proposed

The BNF administers funds from foreign sources for credit purposes:

1. Agency for International Development \$3,000,000  
This is to be a direct credit loan. As distinguished from supervised credit, it will require less servicing. The loan is being held pending tax exemptions as imported items.

2. Interamerican Development Bank (IDB or BID):
  - a. First BID loan \$3,000,000  
This loan was made for the purpose of aiding agriculture and industry.
  - b. Second loan in February 1963 \$2,900,000  
This loan was made from the Social Progress Trust Fund (SPTF). The first loan was made in October 1963. Loans are averaging \$500 to small operators under a supervised credit program.
  - c. Third Loan for Industry (Pending) \$4,000,000
  - d. Fourth Loan for Agriculture (Proposed) \$6,000,000
3. International Development Association of IBRD \$3,600,000  
February 1964. Requires technical and banking services for livestock facilities. Composed of various currencies.
4. German Credit (12,000,000 Marks) \$3,000,000  
Despite the fact that materials purchased from loan funds can come from the Free World, the loan is essentially a grouping of pre-arranged supplier credits with German manufacturers under the guarantee of the German Government.

#### Observations

1. Technical Services to individual farmers and stockmen borrowers are supplied by 30 employees.
2. Twenty-four regional and local level ingenieros-agronomos and agronomos have constant contact with farmers. Two others work in the Central Office with the field technicians, but also work with individual farmers. In the development division there are four veterinarians who advise livestock borrowers.



3. There is a general change in the Bank's administration. The new president of the Bank since August 1965 is Dr. Pedro Ramon Chamorro. The situation is fluid with respect to both organization and personnel. Sessions are being held to review and write the Bank's general policies.

Specific recommendations for the National Development Bank are beyond the scope of this study. However, it is noted that some 30 employees of the Bank are engaged in technical assistance for farmers and stockmen. In a development program for the Extension Service, including backstopping services from the research and technical program, there is need for a close coordination between rural extension and the Bank, in order that those who provide technical assistance to the Bank may be kept informed of the latest technology.

#### D. The Supervised Rural Credit Agency (CAH)

CAH was created to supply credit to marginal farmers, not able to obtain adequate credit from conventional sources. It was intended also to promote organization of cooperatives, assist in developing model colonies and give technical and economic aid to low income farmers.

It is governed by a council consisting of a president and five members, representing the banking sector, technicians, and public administration. It has a secretary general and three departments: (1) Accounting, (2) Supervision, and (3) Administration. The department of supervision is comprised of 11 zone managers with 122 rural supervisors in 60 districts, six home economics works centers, and 43 agricultural clubs.

#### Observations

1. Of the authorized capital of 200 million Guaranies, only 78.8 million has been provided. Repeated efforts of CAH to obtain release of the rest of the capital have not been successful. The GOP pays the administration costs.
2. The collection record of CAH is very low, approximately 50 percent of amounts falling due for the period 1952-1963. As of December 31, 1963, CAH owed 140 million to the Central Bank, and 17.3 million Guaranies to other creditors. The amount owed to CAH was approximately the same.

3. The amount of money available for loans is practically zero. The institution has been reduced to carrying on such activities as multiplication of seed in certain areas, and distribution of farming supplies from stock, (salaries are paid by the government).

In summary, CAH is a loan agency without funds to lend, and without adequate resources to service the loans outstanding. This situation has existed for several years. All concerned realize that for loan purposes CAH is practically ineffective.

As this committee was closing the writing of this report, the Minister of Agriculture and Livestock sent his revision of the committee's proposed reorganization chart (see Exhibit 3).

The revising of the committee's proposal is an encouraging indication of the likelihood that the Ministry units will be reorganized for more effective functioning.

## ACKNOWLEDGEMENTS

The Committee wishes to express appreciation to President Stroessner for the opportunity he accorded us to report highlights of its findings and to share with him his concerns and interests in the development of Paraguayan Agriculture.

The Committee wishes to express its appreciation to Ambassador Snow, Chief of the U. S. Mission, and to John P. Wiley, Director, U.S. A.I. D. and to heads of Government agencies in Paraguay, Dr. Ezequiel Gonzales Alsina, Minister of Agriculture, Dr. Pedro Ramon Chamorro, President, Banco Nacional de Fomento; Dr. Crispin Insaurrealde, Rector, National University; Dr. Federico Mandelburger, Director Planning Secretariat, GOP; and Dr. Juan M. Frutos, President Institute of Rural Welfare, for their assistance and the assistance received from members of their staffs.

Those who particularly rendered advice and assistance to the Committee were:

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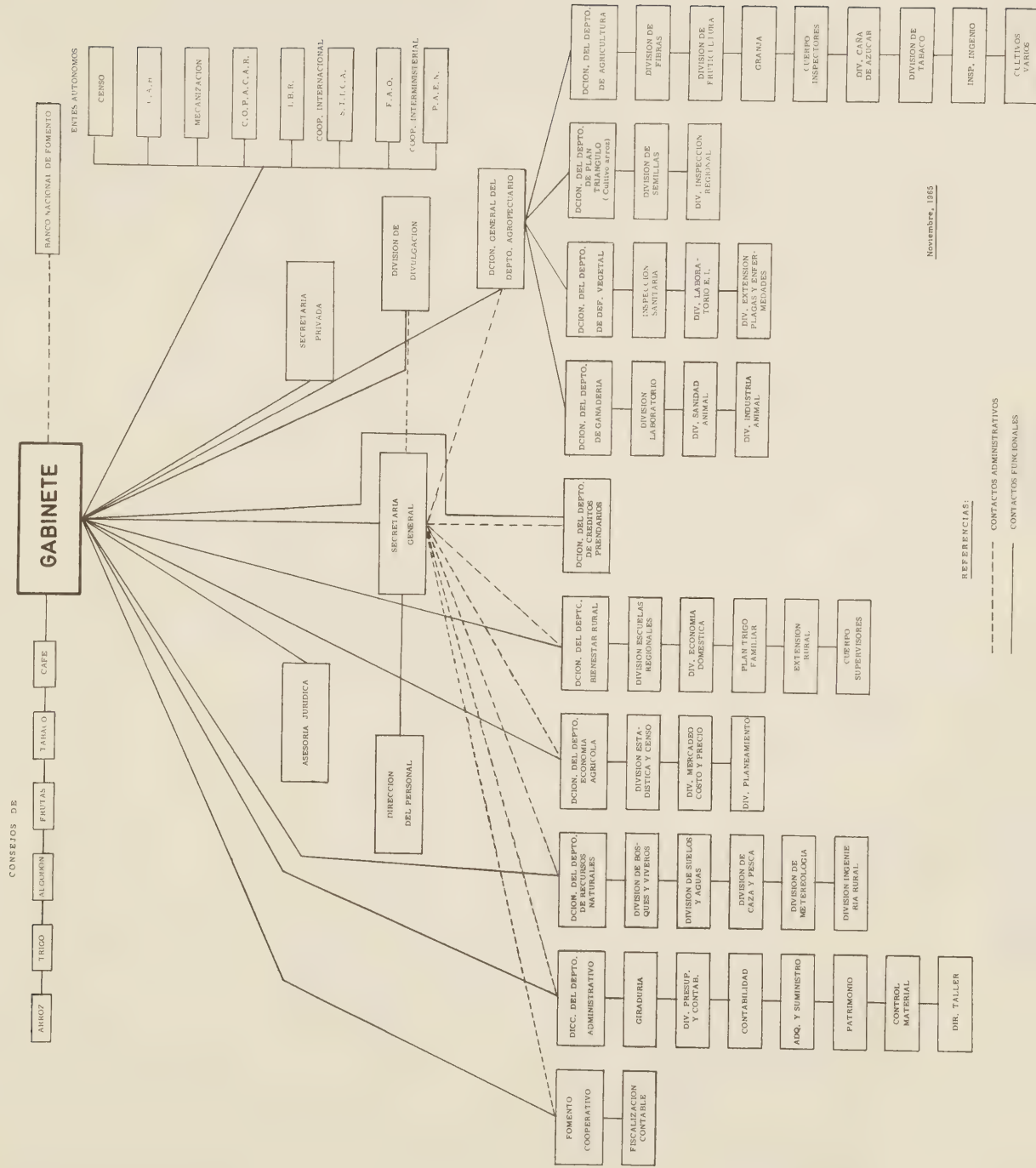


AMERICAN INTERNATIONAL ASSOCIATION

Mr. Walter Crawford, Rural Development Specialist American International Association (AIA), made a unique contribution to the work of the team by working with it during the first two weeks of study and the last week in review. The Committee wishes to express appreciation to the association for making Mr. Crawford's services available.

Many others including, secretaries, graphic specialists, technicians and staffs of several extension offices were most helpful to the Committee in many ways. Without their whole-hearted cooperation it would have been impossible to have completed this report on time.

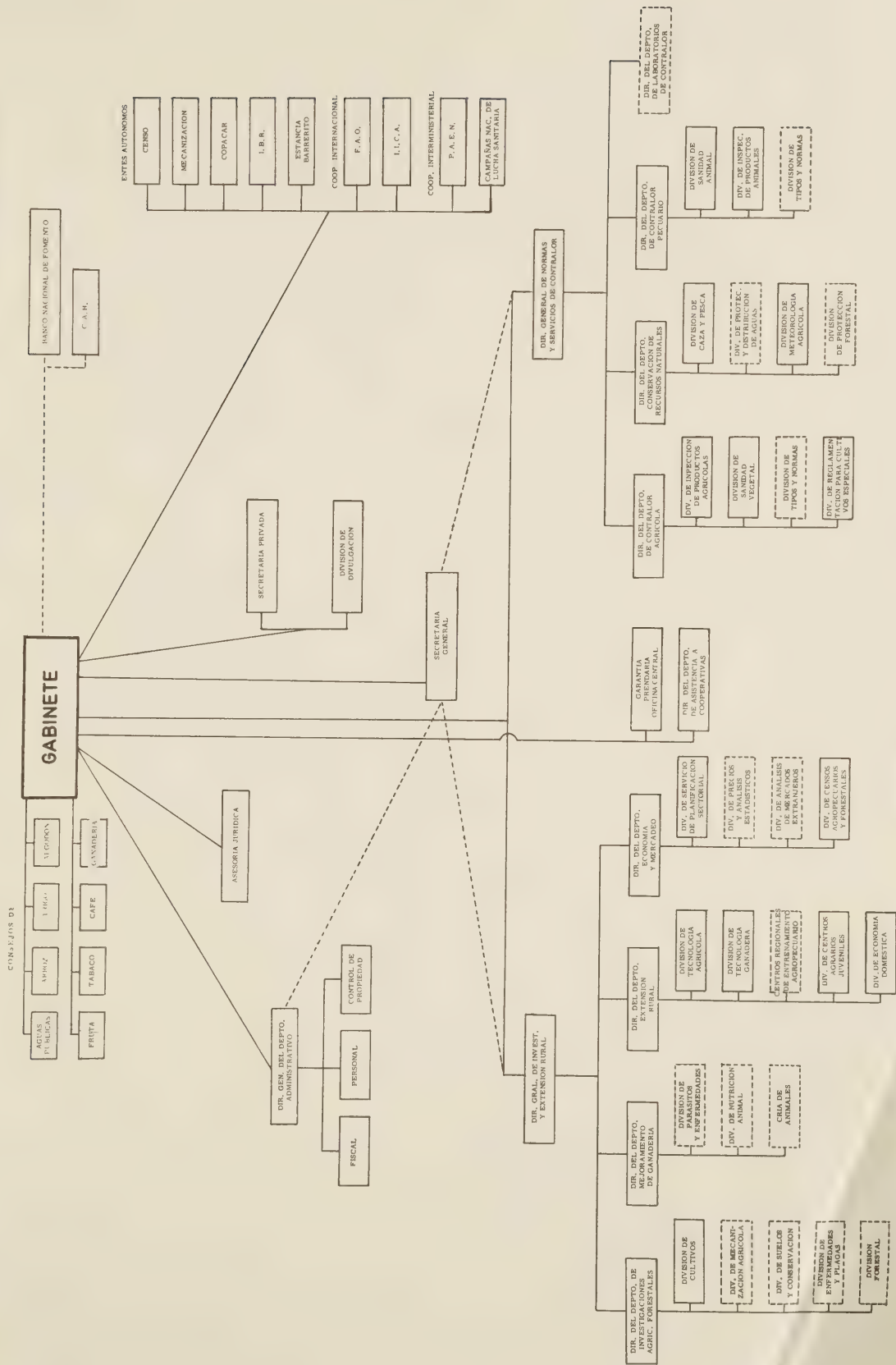








CUADRO No. 2 REORGANIZACION PROYECTADA



## REFERENCES

CONTACTOS ADMINISTRATIVOS

PROYECTADO

CONTACT FUNCTIONALITY

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Noviembre, 1985



## CUADRO No. 3

